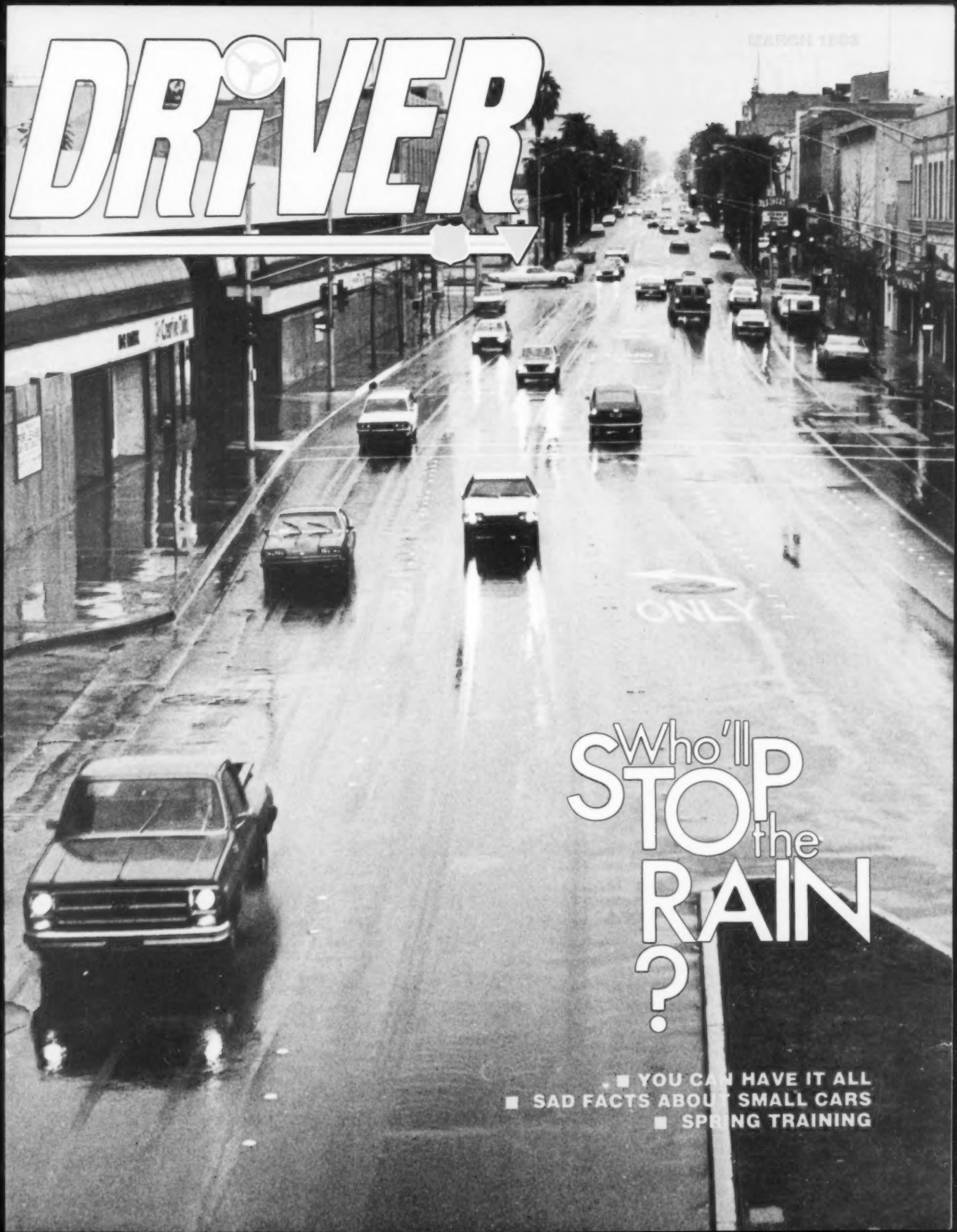
DRIVER
Who'll STOP the RAIN?
■ YOU CAN HAVE IT ALL
■ SAD FACTS ABOUT SMALL CARS
■ SPRING TRAINING

DRiVER

Who'll STOP the RAIN?

Sir Reinalot
Wot's the Dragon forecast, Merlin?
Well, man, I gots a flash flood warning . . .
I gots fog . . .
I gots skiddy streets . . .
I gots a tornado watch in the Texas panhandle . . .
I gots you gots problems . . .

The once and future pothole

In the title song from the play "Camelot," King Arthur describes his kingdom's ideal weather this way: " . . . the rain may never fall til after sundown; by eight the morning fog must disappear . . . the winter is forbidden til December, and exits March the second on the dot . . ."

You may have noticed that spring in the real world is much less predictable than in Camelot. We get rain and fog in the daytime, and snow and ice into April, or even later. One morning may be warm and "springlike" and the next may be gray and cold with rain or snow falling and patches of ice on the streets. Of course, Arthur had Merlin the Magician to help him control the rain. We doubt Congress has the authority to legislate bad weather away, or even limit it.

Until they find a way, we're stuck here in the real spring world with snow, slush, sleet, fog, puddles and cold.

Fog: Unfortunately, fog doesn't clear out by eight. Simply a low-altitude cloud, fog descends without regard to the clock and it may lift and then thicken again before it finally disappears. But fog is even trickier than that. It varies in thickness as you move through it. One moment you can see half a block ahead, the next you can almost make out the leading edge of your hood, and then you can see about ten feet.

Because things like cars, trees and curves in the road can be totally invisible in fog until you are upon them, stay indoors in bad fog unless you must travel. If you must, travel with extreme caution.

In fog, you strain toward the windshield to see farther. You have the uncomfortable feeling your windshield is covered with moisture on the inside or outside, even when it isn't. Sometimes you can't see anything ahead and have to watch to the side of the car for the lane divider or edge of the road, just to make sure you're still on the road. This is the time to get off, stop and wait for the fog to lift.

There may be reflectors on the right side of the road, but these are not posted on all roads. Some foreign countries use distinctive reflectors on both sides of the road. Drive slower in fog than you would in sunlight, and be ready to stop if some obstacle appears through the mist ahead. Use your headlights, even in daylight. At noon they may not help your vision much, but headlights and taillights will enable other drivers to see you. (Germany requires the mounting of a single red fog light on the back of cars that will help following drivers see those ahead in poor visibility.)

Use only the low beams. Your bright lights won't help in fog and they might hurt. If they glare in other drivers' eyes, they'll be unhappy, and if the fog reflects them back into your eyes, you'll be unhappy.

Leave the defroster on in fog as well. Moisture can build upon the inside of windows and complicate the fog problems, and you've got it bad enough without that.

As you travel slowly along in the fog, don't follow too closely. Rear-end collisions are common in fog — some involving many cars. Don't follow anyone's taillights for your position on the road. The guy ahead might not know where he's going and he might even be off the paved portion of the road.

Again, if visibility gets so bad that you can't see at all, get off the road and turn on your emergency flashers. Don't use just the lights because some other driver might be following your taillights and strike your car.

Rain: If rain fell only at night fewer rain-involved accidents would happen because less driving is done in the hours of darkness. Rain can be nearly as slick as snow if you move fast enough on it. Too much speed sets you up for the panic-causing experience called "hydroplaning." Rain also makes things pretty dark, even at midday. So your problems are seeing (and being seen by others) and safe handling.

Very dark, cloudy, rainy days are as dark as twilight. Therefore, use your headlights when it rains, even if you don't think they're necessary. Your lights will help others to see you, especially if your car camoflages well against gray backgrounds.

(left)
Two-wheelers should be especially careful on wet days when skidding is more likely.

continued

DRIVER

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MAR

VOLUME 16 NUMBER 10

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THE EDITOR SPEAKS

DOUBLE CLUTCH

ALCOHOL INCENTIVE AWARDS TO STATES

Last fall Congress completed an intensive examination of the drunk driving problem and enacted legislation to provide the states $125 million in new highway safety funds over the next three years. In February the criteria for a state to receive a basic grant were announced and went into effect immediately. They are:

1. That driver's licenses be promptly suspended for at least 90 days for a first conviction on drunk driving charges, and for at least one year for repeat offenders.

2. Mandatory sentences of 48 consecutive hours in jail or 10 days of community service be imposed on anyone convicted of drunk driving more than once in five years.

3. That motorists with a blood alcohol concentration of .10 percent or greater be considered as driving while intoxicated. (A number of states currently allow higher concentrations.)

4. Increased enforcement of a state's drunk driving laws, accompanied by greater publicity and educational efforts about the stricter laws and enforcement policies.

To qualify for a supplemental grant, a state must suspend the licenses of drunk drivers within an average of 45 days from arrest and implement a minimum of eight other criteria.

In order to be eligible for incentive grants in the second and third year, states will have to get even tougher.

Do you doubt the states want the funds? Can anyone afford to drink and drive anymore?

who'll stop the rain?

continued

Smearing patterns from wiper blades show the rubber has bitten the dust, so to speak. Reflected glare coming through this windshield will blind the driver.

As rain falls it can hide the lane markings and arrows that are painted on the pavement, and glare from headlights can make water in ruts appear to be those markings. Watch it!

Keep your defroster and wipers running. These will keep the rain off the outside and the mist off the inside of the glass. Make sure the wiper blades are good. Not only do cracked wiper blades streak the windshield, but your attention may be drawn to the streaks and away from the traffic.

Even when the rain has stopped, be ready to snap the wipers on. The spray from wet roads quickly covers the windshield, usually from cars that pass you. And just as sure as you see a large puddle ahead, somebody will pass you and splash it all over your car. This water is often dirty, and only the windshield washer will get it off completely. Even good wipers will smear dirt from the fine road spray on wet days.

When your car gets splashed, ease off the gas pedal until the wipers clear your view again. Use the brakes only lightly if you need to, and don't change lanes while you can't see.

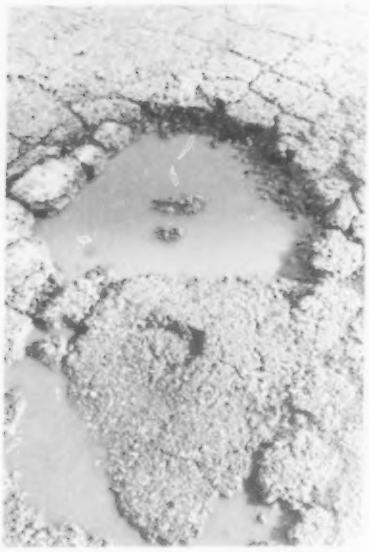
Skidding: And the other problem is handling. Handling is a function of the tires on your car and their tread. The only reason the tread is there is for the wet times. Tread gives traction on water and snow. The tires push down on the water and channel it through the tread grooves. On a dry road you would actually get better traction from a tire with no tread, but on wet surfaces that would be disastrous.

With good tread, you can drive safely on wet surfaces. When the tread is worn away, you might lose control. So replace the tires when they are worn — before the wet conditions make driving dangerous for you.

The kind of danger we mean is wet skidding, or hydroplaning. Hydroplaning occurs when the tires lose contact with the road surface and the car actually rides on a film of water. Water pressure builds up in front of the tires with increased speed and this pressure lifts the car off the road. As you can imagine, there is no friction against the road and your control of the car is reduced or eliminated entirely.

Several factors determine whether your car will hydroplane. (There's a mathematical formula for it, but we

continued



Potholes such as this one are the scars of winter's assault on the roads. Try to go around potholes, but be careful to stay within your own lane.

Hitting a pothole at high speed could severely damage your tires.

won't bore you with that.) One is the amount of air in the tires. Tires that are underinflated are more prone to skidding. Another is the tread, as we've mentioned. Insufficient tread multiplies the danger of hydroplaning.

The other two factors factors are the amount of water on the road and your car's speed. The more speed and water, the greater the danger of hydroplaning. You can't of course, control the rain, but can control your speed. That's right; slow down. Water gives an uncertain footing for your car. Keep your speed moderate and you'll be okay.

360s: When cars hydroplane they do interesting things like 180 ro 360-degree turns and they slide off the road. But you may hydroplane without realizing it. You can motor along at above the minimum speed for hydroplaning (which also depends on tread, water and inflation, remember) and be unaware that you're not in contact with the road until you try to turn or change lanes. Then the car may keep going straight or fishtail or even do one of those interesting 360s.

You can be prepared, though. First, keep your speed down so if you do skid it won't be too bad and you

Road spray from passing cars covers your car with a fine often dirty mist.

can stop it quickly. Avoid the wet spots in the road or puddles that could cause you to lose control.

However, if it happens, you're still not lost. Ease your foot off the gas pedal and use it on the brakes with only a light pumping action. This keeps the wheels from locking up, which would only make the skid worse.

The most important action, however, is your steering. Steer *into* the skid. That is, if the car skids to the left (the rear end goes to the left) turn the wheel to the left slightly until the car begins to straighten out. Then go back to straight-ahead steering. If it skids to the right, steer right. Don't steer too much or too long. This could cause the car to skid in the opposite direction. If that happens, simply continue to steer into each skid until you straighten the car out. Then slow down. You don't want it to happen again.

Soggy brakes: The danger of hydroplaning is only one reason to slow down on wet streets. Another is the danger of wet brakes. Water splashed on the brake linings partially or totally reduces their friction against the drums. The result is the car pays no attention to your foot on the brake pedal — the car won't stop. Or, if the brakes are wet on only one side of the car, they will apply on the other side and you will lose control.

Go around any very deep puddles you encounter if you can. You'll usually have no problem if you go slowing through puddles and keep your left foot lightly on the brakes. The slight amount of friction on the braking surfaces will keep the linings dry, and it won't put any drag on the car if you keep your foot light enough.

Ordinarily, keeping the left foot on the brakes is a bad way to drive because it wears them out, but in this case it's okay.

If you get the brakes wet, driving

continued

(left)
Going through a puddle at high speed could cause you to lose control of the car, or it could wet your brakes and make them useless. At the least, it will give nearby cars a bath in dirty water.

Caring for the STEED

Since we live here instead of Camelot, we have to handle the weather and get around in it. That means we have to get our "steeds" ready to do battle with all the water.

If you're like most people, you don't like to lie down on cold, hard concrete in an unheated garage to work on the car, so you avoid maintenance during the winter. You wait until the regular maintenance is overdue. It is now overdue.

The winter has possibly done some damage to your car that should be repaired before the spring weather has a chance to make it worse. For instance, the salt used in some communities to melt snow has a corrosive effect on metal. It eats car bodies and exhaust system components and then has rubber hoses for dessert. (For a complete look at this problem, see the Backyard Mechanic in the December 1982 DRIVER, "Rust Never Sleeps.")

Give your car a good washing so you can plainly see the damage. The commercial car washes, with their high-pressure sprays, are good for getting built-up corrosives from under the fenders and under the chassis. It wouldn't hurt to have the engine compartment steam cleaned, to make everything easier to see and work on (not to mention cleaner to work on.) Be careful to keep the distributor dry.

If you find rusty spots on the body, tend to them now. Spring brings more water that will make your job harder later on. Check the exhaust system carefully for damage and leaks and replace worn components. Also check all the hoses and fuel lines and repair/replace. Exhaust leaks can let poisonous carbon monoxide into the passenger compartment.

Examine the cooling system and the battery too. They stand heavy usage during winter.

As long as you're under the hood anyway, check out the levels of all fluids (including the windshield washer liquid). Give the car its spring oil change, along with a new oil filter, if it's been six months since the last one.

Another kind of damage done by the winter affects the wheels. Ice, packed snow and ruts in the road can misalign the front wheels. If the tires are worn more on one edge than another, misalignment is a possibility. Another clue is the car pulling to one side or the other (see this month's Backyard Mechanic for more). Get the front end aligned now.

Check the pads or linings on your brakes on all four wheels too. They must be in good condition for safe spring driving.

Examine the condition of the wipers. They might need a change of blades since they've spent so much time clearing off the windshield this past winter. Their job will continue, as will the inclement weather. If they streak or fail to clear off the windows, replace the blades. A switch to the faster speed on the wipers won't help.

For the sake of visibility, keep the windows clean on the inside, so the defroster can clear them off easily. The headlights deserve special attention too. Road dirt will reduce their light considerably, so keep them cleaned off.

Check your tires over with a tread depth gauge. If they only have a sixteenth of an inch of tread they should be replaced. You can tell this point in their life even without a depth gauge because the "wear bars" will show — a raised portion that goes across the tread to tell you the tires have had it.

continued

(left)
Keep your headlights on when the rain falls. Gray clouds and rain make daytime look like evening.

Allow more space between your car and the car ahead during wet conditions. Stops and turns are more difficult on a rain-soaked surface.

for a short distance with the left foot on the brake pedal will usually dry them out fairly quickly.

Floods: While we're speaking of puddles, what about the big ones? Flooded roads should be avoided unless you're sure how deep the water is. Even then, go carefully and remember your brakes. If you go fast through deep water, the water itself will act as a brake, so spare the horsepower.

Driving on a road with a current of water flowing across is like trying to walk parallel to shore in heavy surf. It's rough going and it's easy to lose your footing. The current of water going across the road may not look like much but running water is sometimes powerful enough to tear the road surface away. That certainly makes it strong enough to push your car off the road. Solution: Don't drive through flowing water, no matter how slow you want to go.

Still another danger of driving fast through water is literally "flooding" the engine. You can splash water all over the distributor and wiring and short out the whole works.

Spring brings not only rain but also late snowstorms and ice. Of course, melting snow and slush can be as dangerous as water to the speeding driver. Keep your speed lower than the posted limits on any but the driest roads.

Potholes: We'll mention one more spring hazard, the pothole. Potholes are caused by the freezing and thawing of water during the winter. Water seeps down under the pavement and then freezes. As it freezes it expands (as you can see in your ice cube tray in the refrigerator) and it pushes the pavement up and cracks it. When it melts, the water drains away and leaves a depression under the pavement. A passing car will cave in the pavement and you have a new pothole.

Potholes often have sharp edges that can severely damage tires that hit them at high speed. Watch for them and avoid them whenever possible by driving carefully around them. If you must drive through a pothole, drive slowly so the tires are not damaged.

Since potholes can be hidden beneath puddles of water, this is another reason to be careful when you encounter standing water.

As long as we're stuck here in the real world with its changing weather, we should try to be prepared for anything. We hope these words will help you toward some "happily-ever-aftering" this spring.

(left) High-performance cars are luxury, comfort and style that move quickly and safely.

YOU CAN HAVE IT ALL

High-performance cars attract attention even when they're standing still. This one is a 1984 Corvette in an ocean-side resort hotel parking lot. And since this is the first week in December 1982 it is attracting a lot of onlookers.

The valet is quick to point out that the couple who came in the car are in the far corner of the restaurant having breakfast. Maybe, if we sit close enough, we can hear what they're talking about and planning for the day and the car.

"I don't understand what anybody would do with a car that can go two-and-a-half times faster than the 55-mile-per-hour speed limit, go around corners more than twice what the signs say and stop so quickly that the passenger feels like he is going to tear the belts out."

"You're right, of course. Such cars aren't for everybody and not everybody is capable of driving them safely."

"But why have them to begin with?"

"Basically, high-performance cars are intended for carrying two intimate friends in luxury, comfort and style, quickly and safely."

The "loaf of bread" that faces Corvette passengers doesn't house a glove box. But it is proof that occupant safety has been given the highest priority in design.

The "Gatorback" tires made especially by Goodyear for the 1984 Corvette provide equally exceptional dry- and wet-weather traction because of a very aggressive tread design.

"That's exactly what I mean. How can anyone drive both quickly *and* safely?"

"They can if they are in control because control means safety. And control comes from understanding and using the relationship between the driver and the car harmoniously."

"That's all well and fine, but you didn't use any of the new Corvette's brutal power, cornering prowess or braking potential coming up here last night."

"Well, I didn't call attention to my using it. I've only had the car for two weeks so the relationship between it and me is still growing. Actually, the relationship will continue to grow all the time I have the car. And it is a relationship – like ours – that I have to continue to work at.

"However, I think you'd have a better idea of what I'm saying if you drove the car."

"Me?"

"Yes. Finish your coffee and go to the restroom while I pay the tab and have the valet bring the car around."

"This seat is comfortable!"

"It does mold to your body. Besides, the cushion and backrest bolsters hold you in place laterally. When you get it adjusted for leg length, set the back angle where you want it. Then tilt and telescope the steering wheel to where you want it."

"This is fun."

"It's also important for control. Now, once you've got the mirrors adjusted to where you can see what you want, put on the belt and we'll go."

"Can we lift off the roof panel? I find the open-air sensation exhilarating."

"It's a little cool for that now. Besides, it's easy to remove and stow in the luggage area. Anyway it's clear plastic just like an airplane canopy."

"What if it gets warm and we don't want to stop?"

"Come on now. The windows are power-operated just like the seat you keep playing with and there's always the air conditioner."

"Oh! Look at the lights!"

"Some people like them and others don't. But, at least, the car doesn't talk to you and say 'thank you' every time you do something.

"There are warning lights for oil pressure, oil temperature, coolant temperature, alternator, brake system, choke, security, check engine, low fuel, hatch ajar, door ajar, seat belt, hazard, high beam and directionals.

"In front of you on the left is the speedometer and on the right is the tach."

"The speedometer only goes to 85."

"Yes, and the national speed limit is 55. However, the digital display under the speed scale will go higher than the car's top speed."

"How do you know?"

"Because I've been there."

"On the road!!???"

"No. On a race track.

"In the middle is the fuel gauge. Now with these switches – watch the area around the fuel gauge – you can read either oil pressure or temperature, coolant temperature or voltage, miles per gallon instantaneous or average, and either range or a trip odometer. We can also change everything to metric."

"That's too much for me to look at."

"OK. Well we can turn them all off or just keep on the ones you want."

"But what if something goes wrong?"

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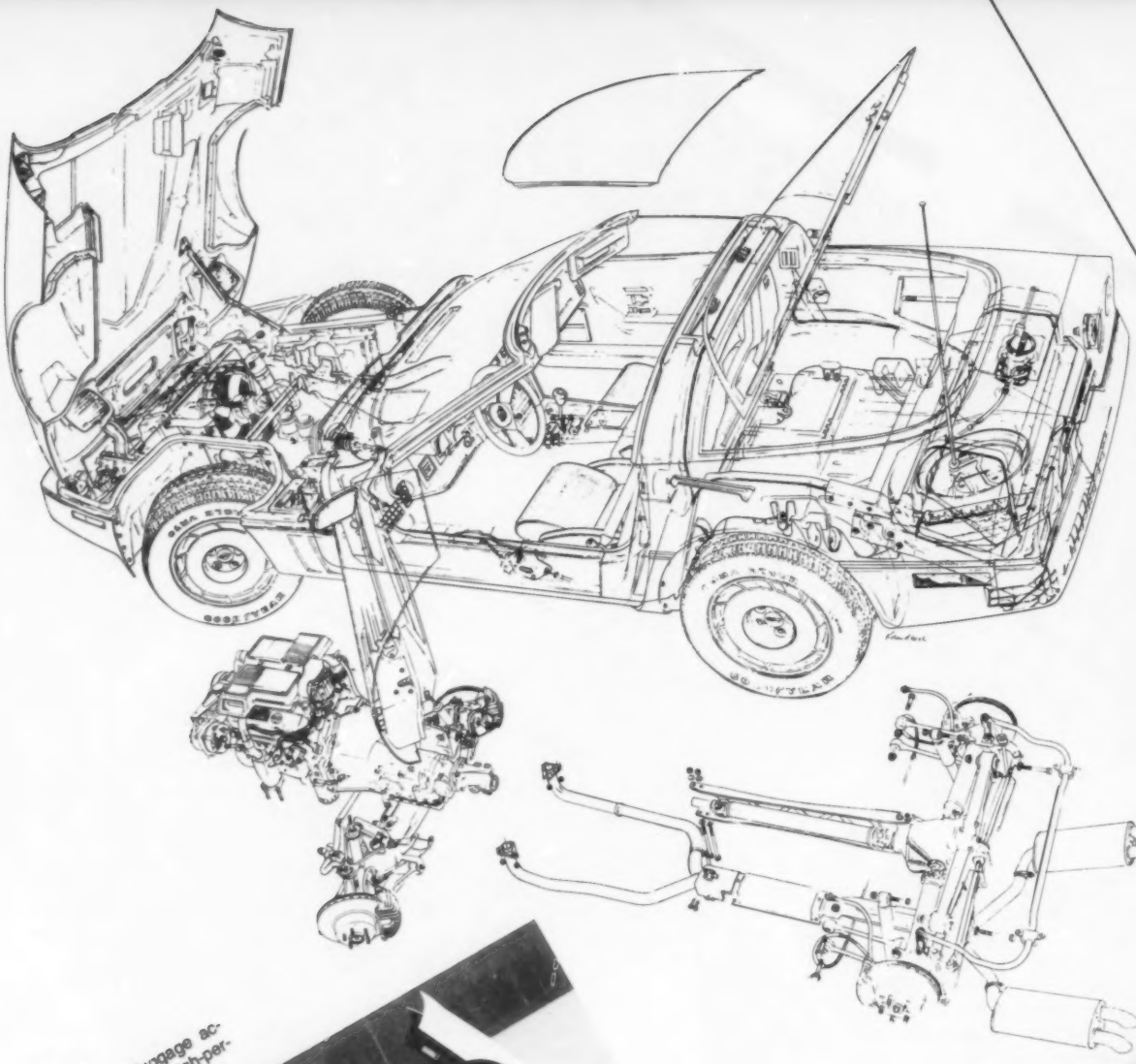


(below) Engine and luggage access enhance any high-performance car's image.

The race track is the best place to learn about a car's abilities.

The 1984 Corvette is a steel car with fiberglass body panels. There's even a steel cage to protect passengers during accidents.

continued

"Then they'll automatically come on full bright with the warning light."

"Wouldn't that be too late to prevent damage?"

"No, there is a safety margin built into the computer system. For example, the oil temperature warning is a function of the car's speed. It will come on at 295 degrees but the engine isn't really overheating until 330."

"Where's the emergency brake?"

"On the left side of the seat."

"But it is down and the light says it's up."

"It stays down and out of your way. Lift it up, push in the button and put it back down to release it."

"Can we go now?"

"OK, turn right at the end of the driveway. Go along the beach road and turn right onto Route 226, cross under the bridge and turn left and enter the northbound freeway."

"I'm getting on the expressway now. Can I see how fast it'll go?"

"No."

"How about how fast it takes to get to 60?"

"Less than seven seconds and we don't need to prove it now. Besides the speed limit is 55."

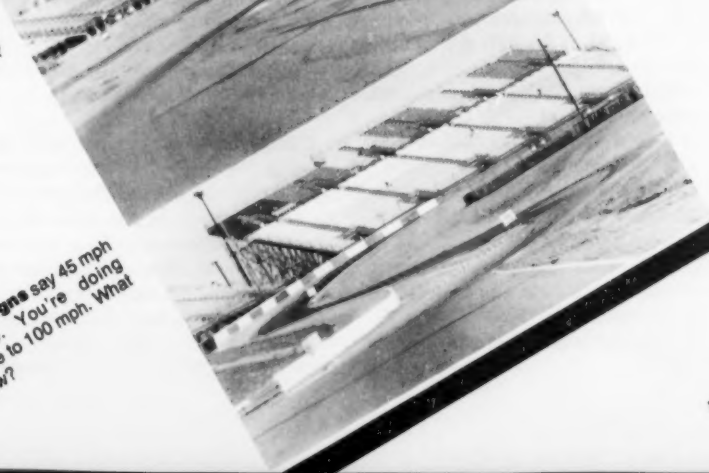
continued

The race track is also where you learn about your own abilities. When are you going to brake?

Do you still accelerate when you're already doing more than 110 mph and it looks like the two concrete walls come together?

You can't see very far ahead on a long, banked corner at speeds over 100 mph, can you?

Are you in the right position on the road as you approach this blind 100 mph corner at 120 mph?



The signs say 45 mph curve. You're doing close to 100 mph. What now?

"Why can't I . . ."

"The freeway is no place to race a car. Besides hard acceleration and high speeds call unnecessary attention to you."

"From the police?"

"Yes, from the police. And from your passenger."

"From you?"

"Of course. I said high-performance cars were for moving two intimate friends in luxury, comfort and style, quickly and safely. With the kind of attention you'd get from me going that fast, that soon, we'd lose the comfort part.

"Besides, you've never driven a car with this kind of power – or at least you haven't driven one like this in the last 10 years or more. You need to work up to handling it. Build that relationship.

"Take the next exit."

"This road is winding."

"It's gentle. When we start across the mountains and come back this afternoon you'll see some real curves."

"Ah, ah, ah . . ."

"I'll be driving then."

"Whew! Thank you."

"Just take it easy. Stay on your side of the road and don't exceed your abilities. Remember the comfortable part."

"How am I supposed to know what my abilities are?"

"If you're going to drive a car like this 1984 Corvette you should enroll in a race driver's or high performance driving school. That way you can find out what your real abilities are."

"That sounds expensive."

"From $300 to $1,500, depending on the school and course."

"What if you don't have that kind of money?"

"Where'd you get the $25-30,000 for a 1984 Corvette?"

"Don't answer my questions with a question. You aren't from New York City."

"Well, there are several other ways and they'll help you learn your car's abilities also."

"Isn't knowing your own abilities enough?"

"No. You should know the limits that both you and the car can reach. Then when you're on the road, stay within 80 percent of both."

"You mean if the car and I are both capable of doing something safely at 50 mph, I should do it at 40 on the road?"

"Basically, yes. As long as it is within legal limits."

"Oh. What are the other ways of learning?"

"Well, wherever you find performance cars you'll find all kinds of competition events. I'm not talking racing fender-to-fender. I'm talking about racing around a parking lot or on an abandoned airstrip against a clock. These events have all kinds of names such as solo or autocross or gymkana.

"Anyway, you ask around other sporty car owners until you find out when and where the next event is. Also find out if they have any special requirements such as competition seat belts or helmets and the like . . ."

"Club membership?"

"Yeah, that too. So – where was I – these kinds of things give you a chance to really find out what you and your car are able to do safely."

"What about rallying?"

"Well, not really. The object is to press the car and yourself to your limits to learn how far you can go and still maintain control. Then you back off 20 percent. Rallying is normally done on public highways and within the law, so there is no real chance to find out what you can and can't do. Exploring the limits of high-performance car driving on public roads just isn't a good idea.

"But you might want to try rallying after you get to know the car."

"Oh. Is that all?"

"There's a modification to the whole system."

"What's that?"

"In order to stay in business, most racing tracks around the country – and the world, for that matter – have to stay as busy as possible. So they rent their surfaces out for club events other than big-time auto and motorcycle races. These events – also run against the stop watches – are often sanctioned by marque organizations such as the Porsche Club of America, Corvette Owners Club, MG, Alfa Romeo, etc."

"And you get to drive your own non-race car on the race track?"

"Well, most clubs do have some safety standards. And they do tightly control the events. But, basically, yes."

"OK, fine. But none of these other things sounds like they have teachers like the schools do."

"That's one thing about club events. There's always somebody willing to give advice and pointers. Of course, you have to sort out the good advice from the bad, but the cost is usually less.

"Besides, you have to learn about your car as well as yourself. So you'll probably have to take the car to one of these events even if you've been to a good school."

"Ah. What's next?"

"Well, if you'll take the next road to the right, we'll stop at the winery five miles down the lane and see if they have released that '81 Cabernet Sauvignon yet."

"That would do good with Sunday's roast. But what if they haven't?"

"Then we'll get some of the '75 Merlot you like."

"Sounds good, but where are we going to put the bottles?"

"There's a couple of lockable storage areas back here."

"We're back on a freeway again."

"I know."

"This is dull."

"I know, but I need it to get us to where we're headed. Turn on the radio."

"Wow!"

"Yeah. The Delco/Bose stereo sound system was designed just for the Corvette with electronically tuned AM/FM stereo radio with auto-reverse cassette play and four direct reflecting speakers."

"That'll keep you awake on dull, straight sections of highway."

"As long as you don't turn it up so loud it drowns out all traffic noises such as sirens."

"You were right. This mountain road is very curvy. How fast are we — I didn't realize you were going that fast."

"As I said, you build a relationship with the car. And you do everything

Even though you can go from place to place quickly and safely, you should still stop every two hours for a rest and to enjoy the scenery.

Don't forget, the police have their own high-performance cars.

so that you don't draw attention from either outside or inside the car."

"What did you do to the seat belt and shoulder belt when we started into this winding section?"

"It's normally a motion-sensitive system, but by pressing the button at the top of the spool housing it becomes a locked system."

"Why?"

"So that I don't get tossed around in the seat and lose some of my control."

"I see."

"The road is straightening out again. I've been driving for the last 100 miles. Why don't we stop and trade seats?"

"Has it really been 100 miles already? Yes, I'd love to get behind the wheel again."

"*Wake up. We're back at the hotel.*"

"What time is it?"

"About three."

"Lunch was better than I had expected in a small-town honky-tonk. How long before dinner?"

"Are you hungry?"

"No, I just want to go down to the spa and work off lunch."

"Sure. Did you enjoy the ride?"

"Yes."

"Just, yes?"

"Well, I learned a lot."

"Such as?"

"Stay within 80 percent of the vehicle's and your capabilities; and stay on your own side of the centerline."

"How about courtesy?"

"What about it?"

"Be courteous to all other traffic. It is another rule of high-performance car driving."

"I don't understand. Shouldn't we always be courteous to other traffic?"

"Most people try to be. But when they start driving high-performance cars, a lot of people develop the attitude that other people should get out of their way. And that they should get out of their way now."

"So?"

"So they start running up on other driver's bumpers, flashing their headlights and doing other nasty things that aren't very courteous."

"What other nasty things?"

"You've heard the term, 'I'm going to blow his doors off?'"

"Yes."

"Well, when you pass somebody who's going slow when you're going real fast you do 'blow their doors off' and are being discourteous as well as inviting trouble."

"What kind of trouble?"

"Since they are going slower than you are, they may not see you coming or may misjudge your speed and make a move that you aren't expecting and can't adjust for because of your speed. That's what kind of trouble.

"Now, may I ask a question?"

"Sure."

"Do you still not understand why anybody would want a high-performance car like this 1984 Corvette?"

"I understand. Performance, luxury and comfort. You *can* have it all and safety, too."

Charlie D. and the Family Tree

WELL, OLD BOY, HOW DOES IT FEEL TO BE FAMOUS?

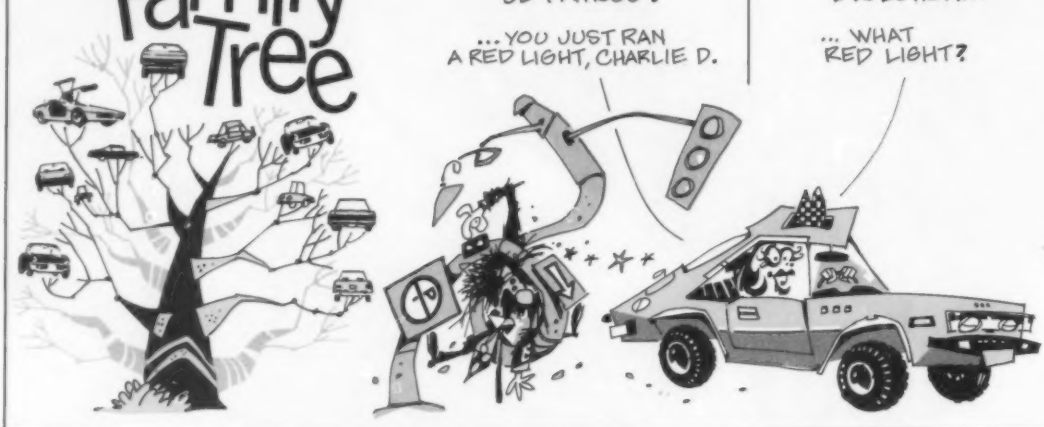
...YOU JUST RAN A RED LIGHT, CHARLIE D.

FAMOUS? ME? **OH-H-H,** YOU MUST MEAN MY NEW THEORY OF EVOLUTION...

... WHAT RED LIGHT?

YES, YOUR NE
"ON THE ORIG
SPECIES
NUT DRI

...YOU'RE GOI
WRONG WAY,



THE GALÁPAGOS FREEWAY? AREN'T THERE A LOT OF ACCIDENTS ON THE GALÁPAGOS FREEWAY?

...YOU'RE DRIVING OFF THE CLIFF, CHARLIE D.

LOTS AND LOTSA ACCIDENTS! I GOT THE IDEA FOR MY THEORY AFTER I STUDIED THE BEAKS OF GALÁPAGOS FREEWAY ACCIDENT CAUSERS...

...WHAT CLIFF?

BEAKS? YOU MEAN NOSES DON'T YOU?

...YOU'RE GONNA HIT THAT LITTLE GIRL'S PUPPY DOG, CHARLIE D!

'BEAKS' I
ANYHOW,
THE PERP
BANDAGE
CRUTCH B
THE EXPR
HAD SOM
BEST SEL

VERY INTERESTING, BUT I FAIL TO SEE HOW THIS VARIETY OF BENT BEAKS LED YOU TO DEDUCE THAT THE ANCESTRAL NUT WAS A **MONKEY!**

... YOUR LEFT FOOT CHARLIE D., THE ONE YOU'RE STEERING WITH? IS THAT A CAN OF BEER IT'S HOLDING?

OF COURSE YOUR AVERAGE MONKEY DON'T THINK MUCH OF MY THEORY. AFTER ALL, MONKIES CAN'T DRIVE A CAR. THEY JUST SIT AROUND ALL DAY EATING BANANAS, SCRATCHING THEMSELVES, MAKING FACES AND, IN GENERAL, **ACTING FOOLISH** ...

...THAT'S NOT BEER, MAN... I CAN'T STAND BEER. IT'S A CAN OF WHISKEY SOUR.

'FOOLISH', YOU SAY? **AHA!** I BEGIN TO **SEE** ...

THE CAR'S WEAVING FROM ONE SIDE OF THE ROAD TO THE OTHER! **ARE YOU DRUNK, CHARLIE D?**

LI
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90
EN

R NEW THEORY:
ORIGIN OF
ES OF THE
DRIVER..."

E GOIN' THE
WAY, CHARLIE D.

IT'S SELLING VERY WELL, THANK YOU... LOTSA BUCKS! **LOTS AND LOTS AND LOTSA BUCKS!**

... WHAT WRONG WAY?

A COOL AND CRAZY CONCEPT — — THAT ALL BAD DRIVERS DESCEND FROM A COMMON ANCESTRAL NUT. HOW'D YOU HAPPEN TO THINK OF IT?

...YOU'RE SPEEDING THROUGH A SCHOOL ZONE, CHARLIE D.

I **EUREKA**'D IT OUT ON THE GALAPAGOS FREEWAY...

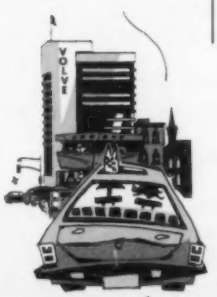
...WHAT'S A SCHOOL DOING HERE?

KS' IS THE WORD! AFTER ALL, THESE TURKEYS WERE THE **CUCKOOS** WHO CAUSED **ACCIDENTS!** OW, IT STRUCK ME THAT EVEN THOUGH EACH ACCIDENT WAS UNIQUE AND UNFORTUNATE, AS ILLUSTRATED BY PERPETRATOR'S SCHNOZOLLA: (A) **THE FENDER BENDER, OR BAND-AID BEAK** (B) **THE COMBINATION BAND-AID AND AGE BEAK** (C) **THE SEVERELY BENT, OR FAILED TAILGATER BEAK** (D) **THE THROUGH-THE-WINDSHIELD, OR CH BEAK, AND** (E) **THE 100 PROOF GURNEY, OR TERMINAL BEAK.** AS I SAY, IT STRUCK ME (IF YOU'LL PARDON EXPRESSION) THAT, ALTHOUGH EACH BEAK WAS ADAPTED TO ITS PARTICULAR ACCIDENT, ALL OF THESE CUCKOOS SOMETHING IN COMMON! AND THAT COMMON DENOMINATOR RESULTED IN ME DREAMIN' UP MY SELLING THEORY! **LOTSA BUCKS, MAN!**... WHAT LITTLE GIRL'S PUPPY DOG?

I HAD FOUND THE KEY!
BAD DRIVERS ARE **FOOLISH!** LIKE THE ANCESTRAL NUT, THEY ENGAGE IN **MONKEY BUSINESS!** WHICH IS ONE THING IF YOU'RE UP A COCONUT TREE SOMEPLACE, BUT AN ENTIRELY DIFFERENT MATTER BEHIND THE WHEEL OF THE FAMILY JUGGERNAUT!

...WHO'S DRUNK? A LITTLE NIP SHARPENS M'REFLEXES...

HERE WE ARE!
THE OLD EVOLUTION TANK. COME ON IN, I WANT YOU TO SEE SOME NOTES ON A NEW THEORY...



IT'S CALLED: **"THE ANCESTRAL HYENA OF THE BACKSEAT DRIVER..."**
...CARE FOR A BANANA?

(left)
You might want to practice taking obstacles that can't be avoided. But keep your eyes on the road ahead.

Five to 45

Do you have a driver's license from Alabama, Florida, Idaho, Mississippi or West Virginia? Then you don't have to have a motorcycle operator's endorsement or license. But if you have a driver's license from any of the other 45 states you are required to have a special license or endorsement to operate a motorcycle. Check with your state's licensing agency for details.

SPRING TRAINING

Motorcycle riding weather has arrived — or at least it should be here shortly. Last month the Backyard Mechanic told you how to get your machine ready for the season; this month we'll tell you about tuning up the rider.

That's right, a rider tune-up. It's been four to six months since the last time you rode your two-wheeler so you aren't as good as you were then. After all, baseball players go through spring training camp before they open their season. Why should you be any different? Your skills need sharpening too.

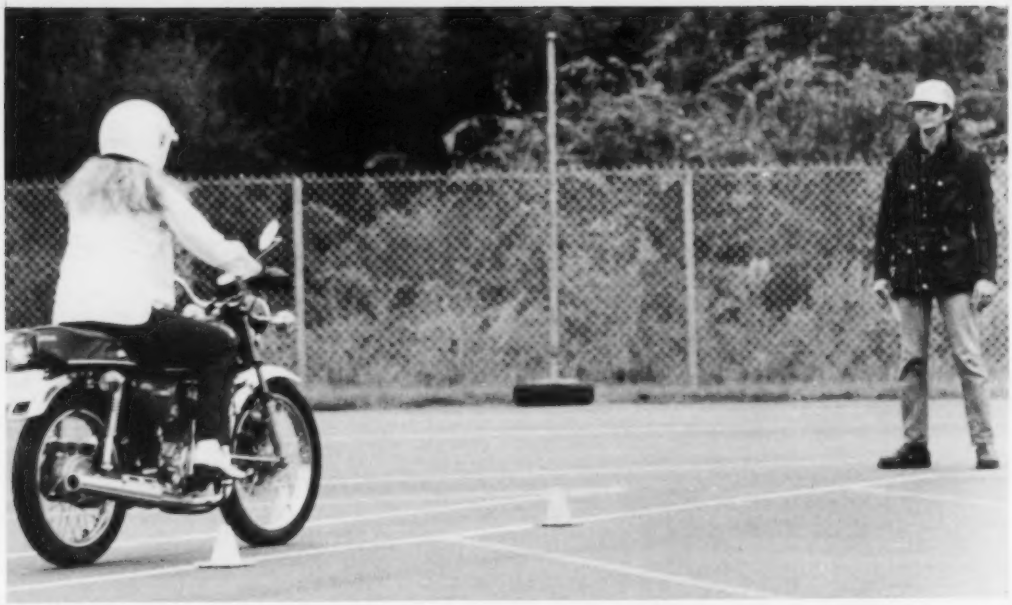
Ideally you should find an empty parking lot and spend at least two hours practicing before taking on the open roads. (It would be a good idea to have permission to use the parking lot. And it wouldn't hurt to look for a lot that has been swept clean of debris because it could hurt if it weren't.)

Among the things that you'll want to practice are:

- **Straight line braking**
- **Tight turns without putting your foot down**
- **Braking in a turn**
- **Evasive maneuvers (countersteering)**
- **Lane weaving**

A better solution is to enroll yourself in a hands-on training class such as the Motorcycle Riders Course or Better Biking Program. At military bases that offer these courses, they are usually free. They are also available in many civilian communities for a nominal fee. Just think of them as your spring training camp.

Another good program is MOST II. MOST stands for Motorcycle Operator Skill Test. Currently a requirement for on-base motorcycle registration within Air Training Command, MOST II is an objective test of your skills as a rider based on "real



Braking is a skill that you can always polish on a parking lot.

world" requirements. And believe us when we say, if you can handle MOST II you're ready for the season.

No matter what route you choose, all these spring training camps pay dividends — the same dividends that such camps pay to ball players. After all, there is nothing worse than missing a season because you hurt yourself through the lack of a proper preseason tune-up.

Lane weaving and peg riding practice pay big dividends.

(left)
Tight turns require the same skills at slow speeds that open-road turns demand at higher speeds.

tteecc!!h double tech with tsgt ron lathrop

COMMENT: I recently took my car to a dealer for a tune-up. The assistant service manager said it was time for a 30,000-mile check-up. I said OK. But the bill came to $275. I feel as if I've been ripped off. Of the charges, $237 was for labor. They only had the car for one day, which works out to about $30 an hour. How are such labor charges calculated? How do service stations and garages get away with this? What can I do to prevent getting ripped off?

REPLY: The going rate these days for car service seems to be about $30 an hour at dealerships and even at some independent garages (although the independents are usually about $5 an hour less than dealerships).

However, you probably weren't billed for the work based on how long it actually took. Most repair facilities use a labor guidebook to price their repairs. This manual specifies how long it should take the average mechanic with the proper tools on hand and skills to complete a specific job.

For example, the estimated time needed to do a tuneup on your car is about an hour and a half, according to one widely used guidebook. Some mechanics might be able to do it faster, while others might take longer. But on the average it would take an hour and a half.

This is called the "flat-rate" method of billing and has often been criticized as a "rip-off" because it is weighted in favor of the repair shop. But it is legal.

This method of billing does provide some protection to you because if the mechanic takes two coffee breaks while tuning up your car or stops to talk to one of his friends, you still are only billed for 1½ hours of labor. And, of course, if the job has to be done over then the flat rate would be substantially less than the actual time spent doing the repair twice.

There are two types of flat-rate billing. One set of time estimates is used by the manufacturer of the car to calculate how much they will pay the dealer to do warranty repairs. Because the auto manufacturers want to keep their warranty costs as low as possible, these factory estimates of the hours required tend to not be long enough to do the actual work — much to the dealers' and mechanics' chagrin. Of course, the dealers wouldn't think of using this low-time guide to charge customers for repairs.

Instead, customers are charged time based on flat-rate guides published by automotive service associations and car repair manual publishers. These flat-rate guides usually specify a longer time for a job, perhaps 25 percent more than the factory specifies.

The additional time takes into account the accumulation of dirt and rust, which can make repairs more difficult, and other factors that can add to the time it takes to do a repair job. It usually takes longer — and it is more difficult — to do certain repairs on older vehicles than on newer ones. Thus the flat-rate guides give the average time.

For example, replacing a starter motor might take about 2½ hours today on a car fresh from the factory. But in five years, when the starter actually fails, the accumulation of grime and rust would make the job more difficult because getting the older starter off would be harder. So the job might take three hours. So the flat-rate book lists the job at 2.7 hours.

Now, if you start putting several jobs together, the times can get really exaggerated. For example, it might take only 29 hours to do a major tune-up, reline the brakes, do a front-end alignment, adjust the valves and replace the clutch. But the shop's flat-rate manual specifies that such work should be charged out for 36 hours labor.

In the case of your 30,000-mile check-up there was much more involved than just that hour and a half tune-up. The oil and filter should have been changed, the transmission fluid changed, the fuel line bled, the brakes checked, the wheel bearings repacked, the brake fluid changed and a number of other precautionary tasks should have been performed. All of which could take up to a full, eight-hour day to perform.

This is not to say that a sharp mechanic can't really buzz through a job. For example, one mechanic recently completed a 3.2-hour job in 66 minutes. The result was a $96 labor charge to the customer which in actual time works out to more than $87 an hour!

I also hope you aren't thinking that the mechanic gets the full $30. No way. A lucky mechanic might see half of that amount (before taxes) in the paycheck. Another 25 percent of that $30 an hour goes into fringes such as health care, retirement programs, life insurance and the like. The remainder must pay for the building, specialized equipment, administrative costs, etc.

Since you are in California I am wondering how much attention you were actually paying to the assistant service manager when he was filling out your work order. He is required to give you an estimate of the total bill which you had to sign before he could have your car worked on. And I'll bet you a dollar to a donut hole he used the flat-rate manual to do that estimate. He also couldn't go more than 10 percent over the written estimate without getting your personal ap-

proval. That's an in-person approval not an over the telephone OK.

This is not to say that there aren't repair shops out there ripping people off. There are. A lot of people are being taken advantage of by repair shops. Shops that make new, inexperienced drivers their prime targets. But it is a very small percentage that are giving the whole business a bad name.

Over-repair is, of course, one of the easiest and most widely used techniques by crooked mechanics. These swindlers will replace as many items as they think they can get away with.

If you've ever stopped at a gas station for a fill-up and left with a brand new set of shock absorbers even though the car rode all right, you know what I'm talking about. Or a better example would be going into a repair shop because your engine was missing on one of the cylinders. And you left with eight new spark plugs and a complete tune-up, when actually only one spark plug had a cracked insulator or bent electrode.

Then there are the injuries inflicted on your car by the repair attendant. The long list of injuries that can be inflicted includes; a short dipstick, foaming battery, barbecued alternator, bent windshield wipers . . .

Another rip-off tactic frequently occurs right at the gas pumps. It is a short-charging on gas and is very easy to do to credit card customers. The crooked operator runs the credit card through the stamping machine twice or uses two tickets. The owner's signature is then forged on the bogus ticket. They can get away with this because many credit card users don't keep their receipts and verify them against their monthly bills.

These problems are to the point where it is estimated that 53 cents out of every dollar spent on automotive service in this country is wasted. In addition, about 40 percent of the costs associated with auto repairs are unnecessary.

Yet it has also been proven that only three percent of all complaints about fradulent car repairs have turned out to actually be fraud. All the rest involved the mechanic just not knowing what to do or how to do it right.

Your first defense to avoid becoming another victim is to know the basics of how cars work. You should know what types of systems make up a car, how each system functions and how often each particular system requires attention. Read the owners manual; buy, read and study the repair manual; enroll in an education class for general auto maintenance, and follow the Backyard Mechanic.

You should attempt to complete as many routine maintenance procedures as possible. These include fluid checks, oil changes, tire rotation and minor tune-ups. In this way there will be far less chance of being ripped off.

It is always smart to look for a repair shop before you need it. This way you can choose the one that is right for you. Ask around about the local shops. Ask your neighbors, coworkers, auto parts counter people, anyone who may know anything that may benefit you.

Be sure to check with the local Better Business Bureau, Chamber of Commerce, or consumer protection agency about complaints about certain shops. This way you can eliminate the bad ones before you waste your time and money.

Once you've found a mechanic, talk to him. Then the mechanic will get to know you and your car. It always helps if you ask for the same mechanic.

Also ask about his reputation. Check to make sure he is certified by the National Institute for Automotive Service Excellence (NIASE). If he is, he will be wearing a shoulder patch announcing the fact. And the shop will also have a large sign hanging up saying they employ certified mechanics.

The maintenance schedule established by the manufacturer of your car is of special value. It alerts you to the need for periodic inspection of things like hoses, connections, brake linings, belts, timing and fluid levels (oil, brake, transmission and coolant).

Keeping good records of your service and repairs is necessary. In addition to being useful at tax time, these records provide useful information when you have questions about needed repairs and service. Also with the help of well kept records you can predict with greater accuracy when certain kinds of repairs or replacements are likely to be in order.

Be sure to visit the different shops and get written estimates of what it will cost to do the work you need. While there might be a small charge for estimates, it will be absorbed in the total savings of having the better shop work on your vehicle.

Don't forget to ask about a guarantee. How long? Under what conditions? And what you'll have to pay for?

When the work is done, go over the bill carefully. It should not exceed the estimate. And it should include an itemized list of all charges for parts, materials and labor.

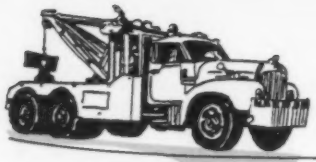
Be sure to ask for all parts back after the repairs are completed. This practice will help insure that a new part or rebuilt part was indeed added to your car. A special helpful hint: be familiar with the brand names on the parts you use (Fram filter, Champion spark plugs, etc.) so that you know the old parts given back have actually come off your car and not someone else's.

As you do seem very concerned about the costs per hour and how you are charged, you can always ask to see the flat-rate manual used by the repair shop and find out how much you are actually being charged per hour. If you are unhappy, go to a different shop. You probably won't find much difference in the hourly rate, but might find a shop that uses a different flat-rate book that estimates less time for certain jobs.

EDITOR'S NOTE: If you have a general interest automotive question that you would like answered, and feel others could use the information also, send it to:

DOUBLE TECH
DRIVER Magazine
HQ AFISC/SEDD
Norton AFB CA 92409

Sad Facts about SMALL CARS



When a Congressional subcommittee on transportation held hearings this past winter, one of the people asked to participate was William Haddon, Jr., M.D., president of the Insurance Institute for Highway Safety.

The Institute had earlier published a report showing extremely high occupant death and injury rates in small cars. The report noted that deaths per registered vehicle in the smallest cars on the road are twice as high as in the largest cars. No matter what kind of crash, the number of deaths per registered small car is alarmingly high, but some small cars do even worse than others. As a group, Japanese-made cars were found to have even higher death and injury rates than cars of comparable size made in the United States. Unless you were completely isolated from radio, TV and news-

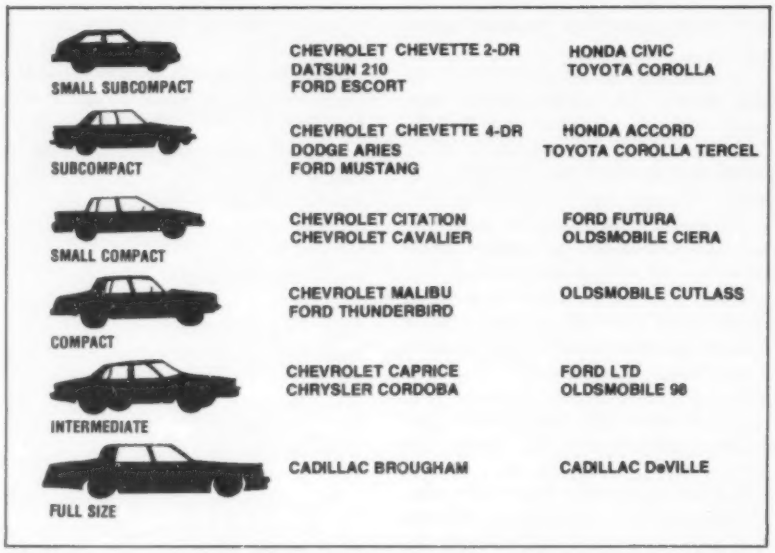


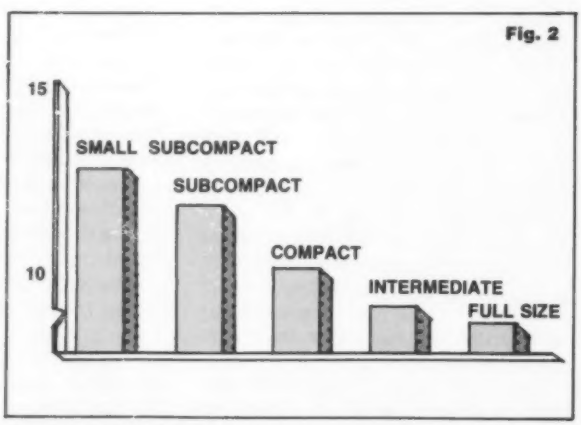
Fig. 1

Examples of cars by size, 1982 models, according to the Institute's present definitions. The charts following are based on five size categories instead of six but still illustrate clearly how risk decreases as size increases.

	Wheelbase
SMALL SUBCOMPACT	less than or equal to 96"
SUBCOMPACT	greater than 96" and less than or equal to 101"
SMALL COMPACT	greater than 101" and less than or equal to 106"
COMPACT	greater than 106" and less than or equal to 111"
INTERMEDIATE	greater than 111" and less than or equal to 120"
FULL SIZE	greater than 120"

Fig 1A

The institute uses these definitions of car size, since auto manufacturers definitions change with the times. Cars with wheelbases that manufacturers once called "intermediate" are now called "full-size" to reflect the general downsizing of the last decade so such terms become meaningless.



Frontal crashes into fixed objects, percent of drivers with serious and fatal injuries, 1972-80 Models, Maryland 1974-80

papers in 1981, you could not have missed the fuss and furor that report caused.

In his statement to the Congressional Committee, Dr. Haddon answered two of the questions most frequently raised by readers following the appearance in DRIVER of articles about small cars and accidents:

When all the big cars are finally gone to the junkyard, won't small cars be safer than they are now?

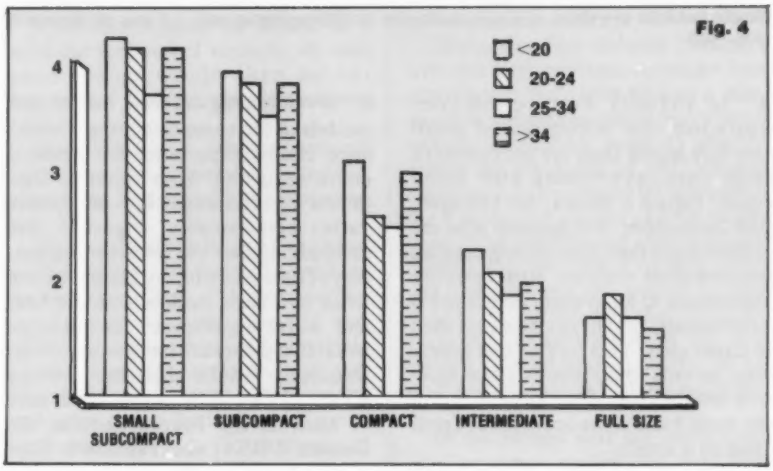
Dr. Haddon says no. "A greater percentage of drivers of small cars, as compared to drivers of larger cars, sustains serious and fatal injuries in single-vehicle crashes — those in which the size of 'the other car' plays no part since no other car is involved." (Figure 2)

Because small cars are more maneuverable, aren't they less likely to be involved in crashes in the first place and doesn't that offset the disadvantages to small-car occupants when they are in crashes?

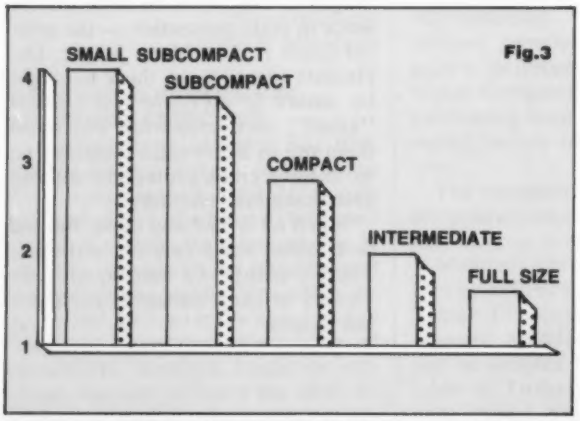
Again, Dr. Haddon says no. "There is no evidence to support this, and what evidence there is suggests that small cars actually are more rather than less often involved in crashes." (DRIVER adds that small size alone does not insure maneuverability, which has more to do with tires and suspension. A small car can be quite maneuverable but it isn't always.)

Here are some other interesting quotes from Dr. Haddon's statement:

■ "It has been repeatedly documented that occupants of small cars, *when they are in crashes,* have a much greater likelihood of sustaining serious or fatal injuries than do occupants of large cars. This Figure (3), based on police accident reports from the state of Maryland, illustrates this point. It shows that the percentage of drivers in small subcompact cars sustaining serious and fatal injuries in crashes is about double the percentage of drivers of full-size cars sustaining such injuries."



Driver age, percent of drivers with serious & fatal injuries, 1972-1980 Models, Maryland 1974-1980



Percent of drivers with serious & fatal injuries, 1972-1980 Models, Maryland 1974-1980

■ "It has been asked whether the poor performance of small cars somehow is due to their being more often driven by young people, who have a high likelihood of involvement in motor-vehicle crashes. Available data indicate this is not the case . . . Figure 4 shows by driver age the percentage of crash-involved drivers of cars of various sizes who sustain serious and fatal injuries. In each of the age groups, the drivers of small subcompacts involved in crashes have a substantially higher chance of sustaining a serious or fatal injury than drivers of full-size cars."

continued

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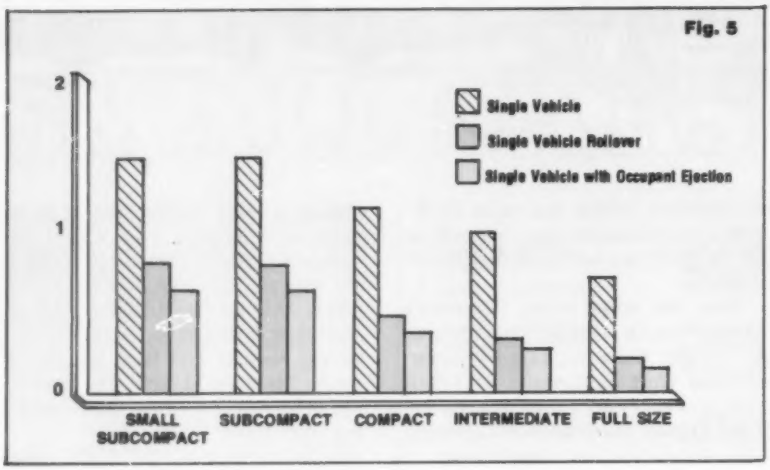
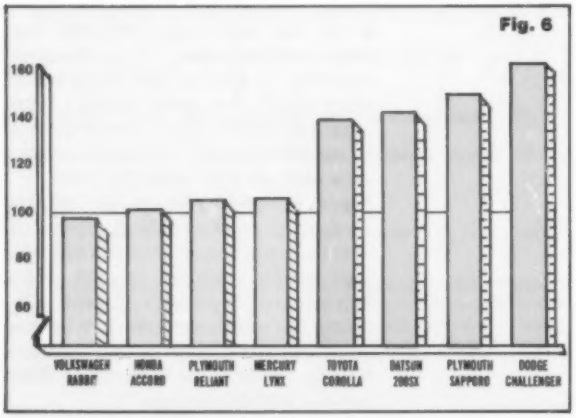


Single vehicle crashes, occupant deaths per 10,000 registered cars, 1-5 year old Models in 1978-1980

■ "In virtually every crash configuration, the occupants of small cars fare worse than the occupants of large cars, everything else being equal. Figure 5 shows, for example, that the number of occupants who are ejected from their cars during crashes because their vehicles' structures are inadequate to keep them contained is substantially higher in small cars than in larger cars. This finding has especially serious implications since ejection long has been known to be one of the most hazardous occurrences possible in a crash."

■ "Even among different makes and models in the same size group, insurance claims experience for medical costs resulting from injuries sustained by passenger-car occupants varies considerably. Figure 6, for example, shows the relative frequencies of first-party injury claims for the small two-door models with the best and worst experience. As a group, small two-door cars have worse claim frequency results than the average for cars of all sizes. Some small cars — such as the Toyota Corolla, the Datsun 200SX, the Plymouth Sapporo, and the Dodge Challenger — have results that are between 38 percent and 60 percent worse than average. In sharp contrast, other cars such as the Volkswagen Rabbit, Honda Accord, Plymouth Reliant, and Mercury Lynx, do substantially better. One reason the Volkswagen Rabbit performs better than other cars in its size group may be that many Rabbits are equipped with automatic seat belts. Seat belts, if worn, reduce the chance of death and injury for passenger-car occupants by about 50 percent."



Relative Claim frequencies, personal injury protection coverages, all medical claims, best and worst 1979-1981 subcompact 2-door Models

So what does all this mean to us average drivers? It certainly doesn't mean that we should refuse to buy and drive small cars. It does mean that we have to get serious about wearing safety belts. Belt use is higher in small cars than larger cars, but it's not nearly high enough to offset the inherently greater hazards to occupants of these cars in crashes. Look at Figure 5 again and see how in single-car crashes the vehicle rollovers and occupant ejections increase as the size of the vehicles decreases.

We have to remember that our small car is not going to forgive our driving errors, particularly excessive speed. The higher the crash speed and the smaller the car, the worse our chances of surviving. There just isn't enough energy-absorbing material between us and whatever we've crashed into. Incidentally, that's why when we speak of various sizes of cars we speak of wheel base. The weight of the car is of little importance in crash protection — the critical factor is size. Many people, Dr. Haddon among them, think we might be smart to increase the size of "small" cars somewhat but build them out of lightweight materials so as to have crash protection without sacrificing fuel economy.

When all is said and done, the sad facts about small cars are statistics. There's plenty we can do as individuals to keep ourselves off those bar graphs.

STUPID LAW?

This letter to the editor was originally published in a Michigan newspaper:

I would like to tell your readers how mad I was when I was forced to go out and pay $45 for an infant seat, and to top it off we couldn't fit everybody in my pickup truck with that big bulky thing.

On April 2, my wife was forced to go off the highway into a ditch to avoid a collision – that's 55 mph to a dead stop. The back of the child car seat was facing the windshield (as I was told the law required for four-month-old infants). That seat broke off the ash tray, cracked the dashboard and chipped the windshield. Our baby didn't have a scratch on her.

I would like to thank God and whoever else is responsible for passing that stupid law.

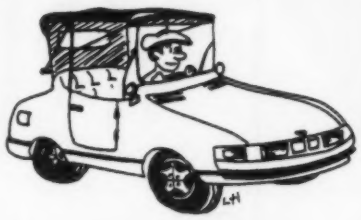
Greg Hibbard
Holton, Michigan

FREE CHILD RESTRAINTS REPORTED EFFECTIVE

An insurance company has concluded that its program to distribute free restraints to its Michigan policy-holders who have a child born or adopted into their households is reducing the likelihood of minor and severe injuries among those children.

In the two years since League General Insurance Company of Southfield, Michigan, began the program, the rate of injury per child involved in motor vehicle crashes declined by 39 percent, the company reported in an evaluation submitted to the National Highway Traffic Safety Administration.

League General said it estimates that 80 to 85 percent of their eligible policy holders had obtained the free car seats.



REMANUFACTURED CARS

Within 10 years, cost-squeezed Americans could be trading in their old cars for remanufactured ones, according to a report issued recently.

A remanufactured car would be a used car stripped of virtually all vital parts which would then be re-engineered and precision reassembled.

The panel said remanufactured parts are equal or superior to the original parts and cost 40 to 60 percent less.

The panel which issued the report is the Arrow Advisory Council on Remanufacturing. "A remanufactured auto could be a second car, perhaps just to commute to the train or run weekend errands, and you wouldn't have to take out a second mortgage to pay for it," said Council Chairman Harry A. Holzwasser.

FORD OFFERS CATALYTIC CONVERTERS TO OVERSEAS RETURNEES

Military members overseas with vehicles manufactured by the Ford Motor Company can save money by purchasing their new catalytic converter before returning from overseas.

The company is offering converters to overseas members at considerable savings over stateside prices.

Members can obtain more information by writing the company at: Ford Export Division, 153 Halsey Street, Newark, NJ 07102. Or the converter can be ordered by writing the same address. Orders should include the year, model, engine size and vehicle identification number.

HLDI LISTS LEADERS IN COLLISION LOSSES

General Motors' 4-door Oldsmobile Delta 88 had the best collision coverage loss experience among high-volume 1982 automobiles, and the Mazda RX-7 the worst, the Highway Loss Data Institute (HLDI) has reported.

In its latest research report on insurance losses relating to collision coverages for 1980-82 cars, vans, pickups, and utility vehicles, the research group said eight of the ten 1982 autos with the best collision coverage loss experience were either 4-door models or station wagons and all but one were domestic models.

The Honda Accord 4-door was the only import that appeared on the HLDI "10 best" list.

The research was based on collision coverage and loss data supplied by 11 major insurers.

Of the five high-volume 1982 cars with the best collision coverage loss experience, the Delta 88 had a relative average loss payment per insured vehicle year of 55, some 45 percent below the result for all 1982 models combined. (The value 100 represents the average for all cars of each model year.) The Ford Escort station wagon ranked second, with a relative average loss payment per insured vehicle year of 61, followed by the Chevrolet Cavalier station wagon at 64. The Honda Accord ranked fourth, at 73, and the Oldsmobile Cutlass was fifth, at 75.

Of the 10 cars with the worst collision coverage experience, six were sports or specialty models and the rest were regular 2-door models. Among the high-volume models, the Mazda RX-7 had a relative average loss payment per insured vehicle year of 197, nearly twice the average. The Chevrolet Camaro had a relative average loss payment per insured vehicle year of 180, followed by the Ford Mustang at 140, the Toyota Celica at 135, and the 2-door Datsun 210 at 132.

Copies of the report, "Insurance Losses, Collision Coverages for Passenger Cars, Vans, Pickups, and Utility Vehicles," may be obtained by asking for HLDI research report R82-2. Write the Communications Dept., Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.

THE BACKYARD MECHANIC

A spring auto check-up is like a board game where you get all kinds of clues as to who-done-it. However, instead of pictures on cardboard cards the clues to the mysteries of the past months' damage to your car are recorded on the tread of your tires.

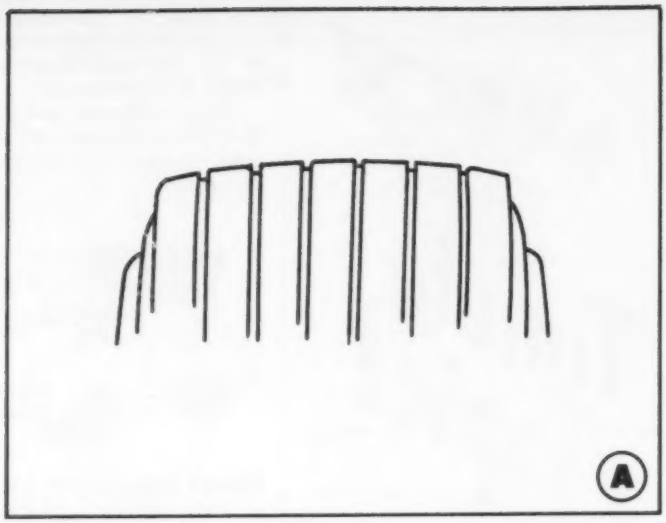
The suspects are of course Dame Spring and Old Man Winter. Spring usually uses potholes and chuckholes to commit her crimes. Winter sticks to rough conditions for perpetrating his offenses.

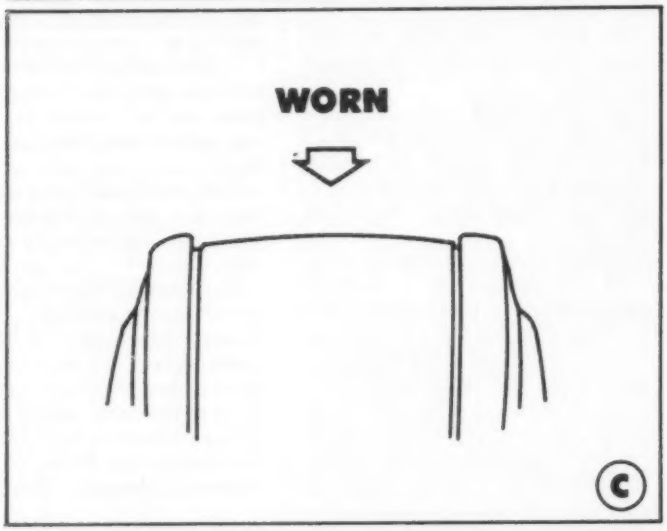
Their crime is murder. They are murder on your car's wheel alignment, shock absorbers, suspension system and tires. And they can be murder on you because the damage they cause can make driving unsafe.

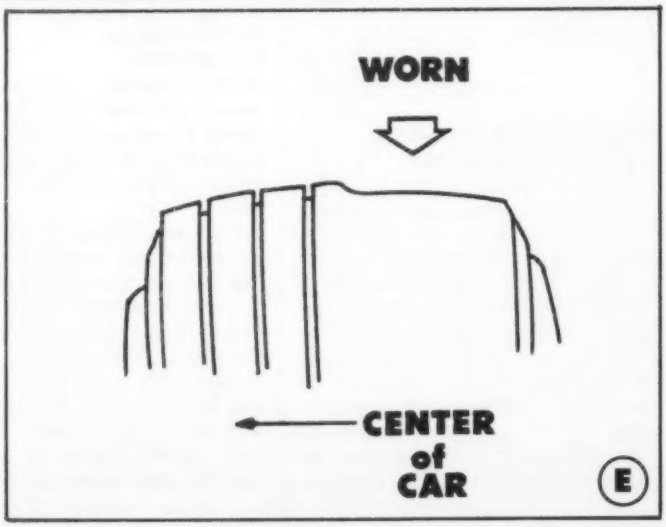
These two suspects bend tie rods, produce severe misalignment conditions, wear out shock absorbers and ball joints, and even damage springs. One victim reported that two new front tires were worn to the wear bar indicators within a period of three months. It turned out that he had a bent tie rod and his car's front end was severely out of alignment.

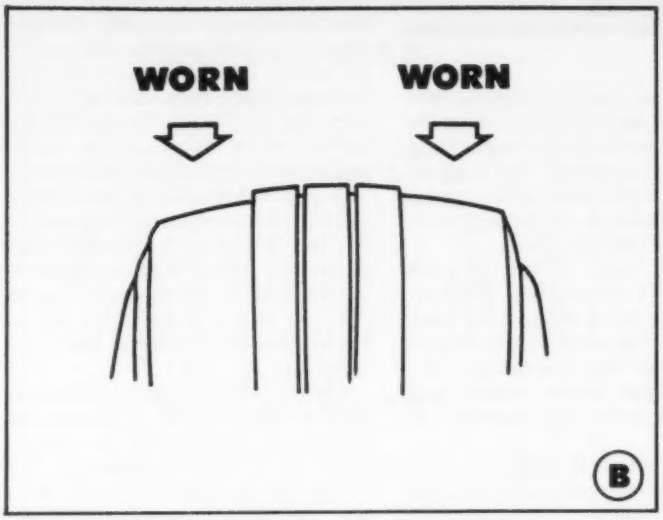
If one or both of the suspects have been at work on your car's front end, there will be indications. For example, if the car tends to pull to the left or right on straightaway driving, the wheels may be misaligned. Sometimes misalignment is visible. The front tires will point slightly in or out or tilt somewhat rather than being properly adjusted.

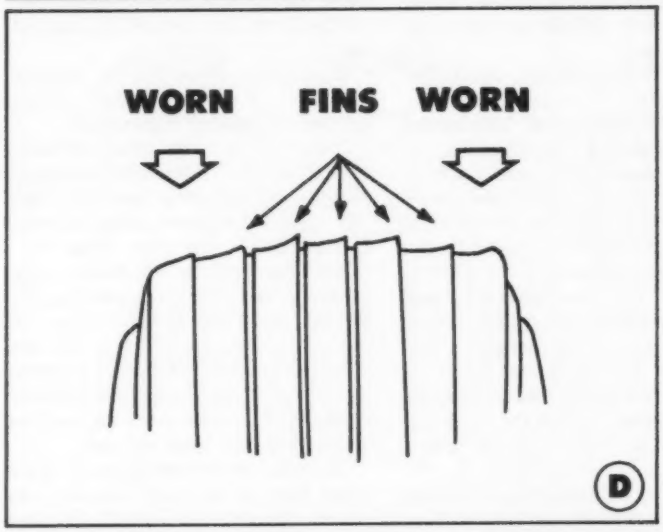
Indications that your shock absorbers have been assaulted by

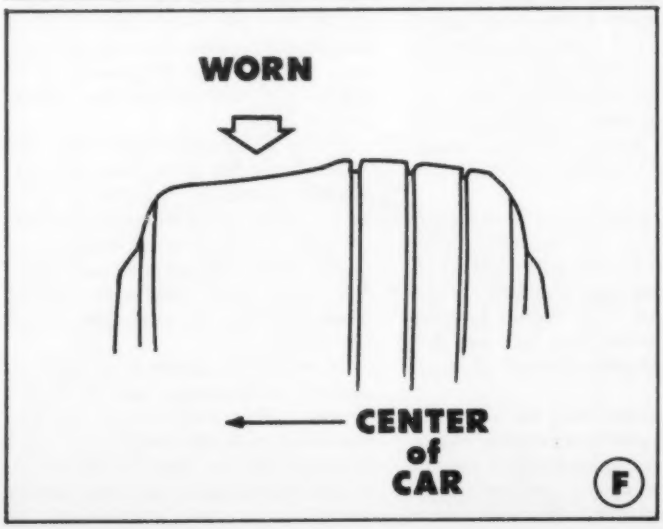












Spring or Winter are severe body sway, front end dip while braking and a bouncing ride. Ultimately, stability in maintaining a steered path is affected and traction is reduced in skidding and sliding conditions.

Spring and Winter can also damage or excessively loosen suspension system parts. These attacks will adversely affect the wheel alignment, cause uneven, premature tire wear and possibly result in a dangerous shimmy that makes driving unsafe.

Once you've surmised that a crime has been committed against your car by either Dame Spring or Old Man Winter or both, you can start gathering clues. Clues that are as plain as the nose on your face, so to speak. They're very easy clues to see and feel.

All you have to do is look and feel the tread on the tires (while the car is in a park position, of course). Reading these clues and making the proper deductions from the information they provide isn't too hard.

First, to recognize a tire that has been assaulted you must know what a tire that hasn't been attacked looks like. Clue "A" represents a tire tread that is wearing properly and therefore depicts a car that hasn't been the target of Spring or Winter's abuse. Notice that the grooves are the same depth across the tread. The tread will feel smooth when you run your hand across and along the tread. There'll be no waves or edges.

The next illustration, Clue "B," represents what is probably the most common crime. And this sin is not committed by either Spring or Winter. In Clue "B" the shoulders of the tread are worn down more than the center ribs. This rapid wearing of the tread's outer edges is caused by underinflation. Because the tire has not had enough air pressure in it to support the vehicle's load the center of the tread has not even been touching the road surface.

Such a wear pattern can also result when the vehicle has been overloaded or the tires are too small to support the car's weight.

Regardless of the reason, Clue "B" points to the car owner as the criminal. A criminal who is not only killing the tires, but could also kill everyone in the car. Underinflated tires will eventually fail because of excessive flexing and/or heat build-

continued

continued

up. And if that happens on the road at high speed, there can be an accident resulting in serious injury or even death.

Clue "C" is the opposite wear pattern of Clue "B." In Clue "C" only the center ribs are worn. Again, this crime was done by the owner — the tire had too much air in it. Overinflation raises the tire off the road surface until only the center portion of the tread wears.

Again, the owner is killing the tires and may cause a serious accident. Overinflated tires ride hard and are very vulnerable to impact damage and weakening of the tire body.

Tires can live long and full-service lives if they are kept at recommended inflation pressures. That's old news, but it is still important news.

To avoid being your own worst enemy, check your tire pressures at least once a month. And when you increase the load in the vehicle, add more air to the tires.

Never "bleed" or reduce air pressure when tires are hot after long drives. This includes trying to reduce the pressure in a tire that has been driven down to "cold" inflation specifications. The tires will return to normal when they cool down. And don't let air out of tires in an attempt to gain extra traction in snow or on ice. It doesn't work and you'll have a seriously underinflated tire when you're done.

For inflation purposes, a "cold" tire is one that has been parked for at least three hours or not driven more than three miles after sitting for three hours.

Clue "D" will separate amateur sleuths from true tire detectives. Both shoulders are worn more than the center of the tread, as if the tire had been underinflated. Yet the tire's inflation pressure has been kept reasonably accurate. There are also little fins on the tread ribs that can be felt when you run your hand across the tire.

The wear pattern in Clue "D" develops when the tread is sideslipping across the road's surface. And that happens when the car is constantly cornered at high speeds. Again, the culprit is not Spring or Winter but the owner and driver.

It is interesting to note that most drivers who insist on high-speed cornering — even on city streets — turn faster to the right than they turn to the left. This is because their upper body weight is supported by leaning against the closed door when turning to the right and no similar support is available during left turns.

Clues "E" and "F" are the result of incorrect (excessive) camber, accelerating tread wear. Too much positive camber caused rapid wear on the outside of the tread in Clue "E" while too little camber caused rapid wear on the inside of the tread in Clue "F."

Bear in mind that it takes a whole lot of incorrect camber to greatly accelerate tread wear. Usually a degree or so is no crime and won't make all that much difference in tread wear.

Next to underinflation, the single biggest thief of tire tread materials is incorrect toe adjustment. The visual or feelable trailing flap of rubber at each tread groove area seen in Clues "G" and "H" is a dead giveaway that toe is not correct for the vehicle. Such a wear pattern is called feathered edge or sawtooth.

If you run your hand over the tread towards the center of the vehicle and feel sharp edges while doing so (Clue "G"), the wheel is not toed in enough. If you feel the same thing as you move your hand in the opposite direction (Clue "H"), toe-in is too much.

Clue "I" is a characteristic of bias ply tires. They display a rapid wearing of the second rib in from each shoulder of the tire. This is the nature of the beast and cannot normally be corrected by inflation pressure, wheel balance, wheel alignment, etc. The best answer to holding down second rib wear is proper maintenance that inclues periodic tire rotation.

Irregular depressions in the tread as seen in Clue "J" are called cupped, dished or scalloped tread wear. These are sure signs that either Dame Spring or Old Man Winter has had their way with your car and left damaging gremlins behind to haunt you.

The ball joints may be loose and allowing the camber to change slightly by first loading one side of the tire and then loading the opposite side of the same tire. Or a shock absorber may be loose or worn out, permitting the wheel/tire assembly to hop (bounce up and down) while rolling on uneven road surfaces. Or it could be loose tie rod ends, idler arm bushings, etc., that cause flat spots to develop on the tread surface which aggravate wheel hop and imbalance.

If you find fins on the tread while moving your hand around the tread as in Clue "K," the tire is probably out of balance. Wheel imbalance and excessive lateral and/or radial runout (the tire and/or wheel being out of round) will upset normal tire tread wear.

Once a tire has developed flat spots such as those in Clue "J" because of imbalance, mechanical or runout problems, no balance procedure will correct the problem. However, there are tire truing procedures that can make the tire reasonably round again so that it will accept and hold a balance.

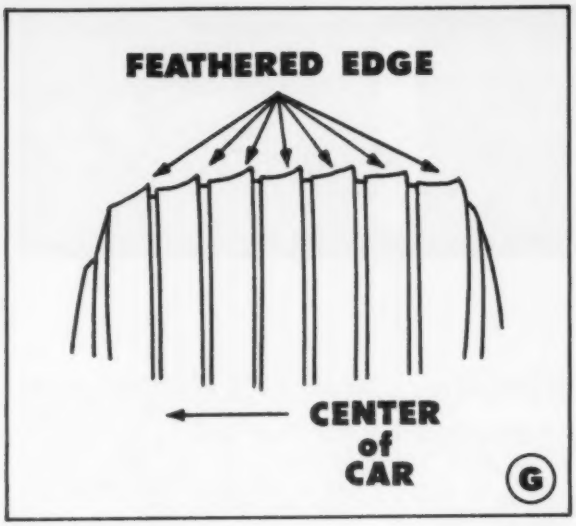
Excessive wheel runout requires replacement of the defective wheel. So does excessive tire runout.

Clue "L" is even more common than Clue "B." Although it is illegal to drive on tires that look like Clue "L" in most states, it is not a crime that produced the clue. Clue "L" shows the built-in treadwear indicators or "wear bars," appearing like narrow strips of smooth rubber across the entire tread area. At this point the tire has been worn down to 1/16th-inch or less tread and must be replaced. The tire is worn out and the danger line has been reached.

To drive on tires worn down to the wear bars is to invite trouble. As stated before, it is illegal in most states. But the real trouble comes because tires this worn are 40 times more likely to blow out or go flat than new tires. Besides 90 percent of all tire trouble occurs in this last 10 percent of life.

These technically "bald" tires also increase the risk of skidding. On wet, smooth pavement, the risk of skidding is about twice as great with bald tires as it is with tires of average tread depth. And skidding is already up to five times more likely with average tread depth tires on wet roads than on dry roads.

Now that you know what the indications of Spring's and Winter's crimes against your car are, and can use the clues to unravel the mysteries behind these sins, you should be able to get your car ready for safer driving ahead.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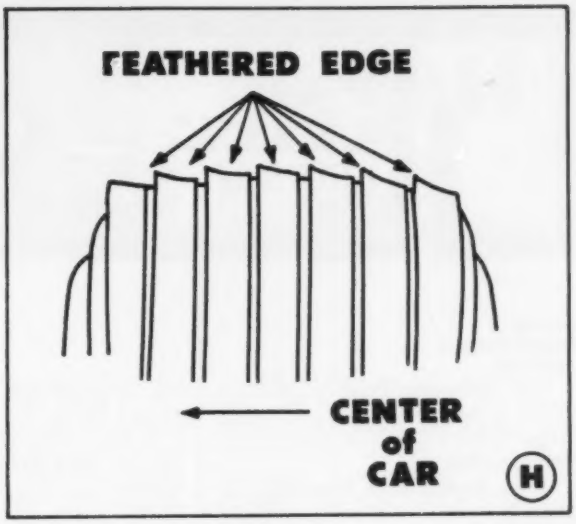
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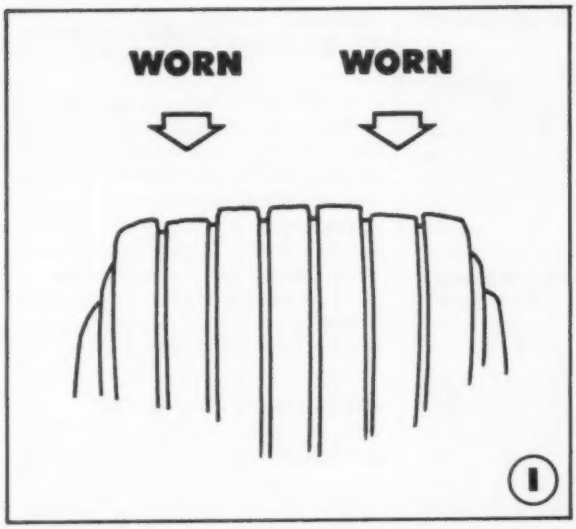
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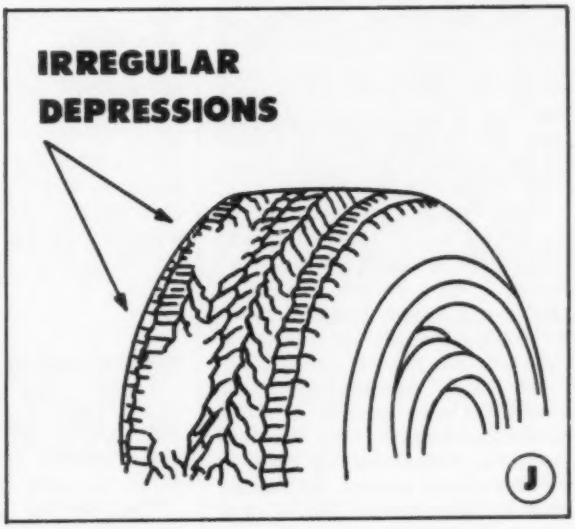
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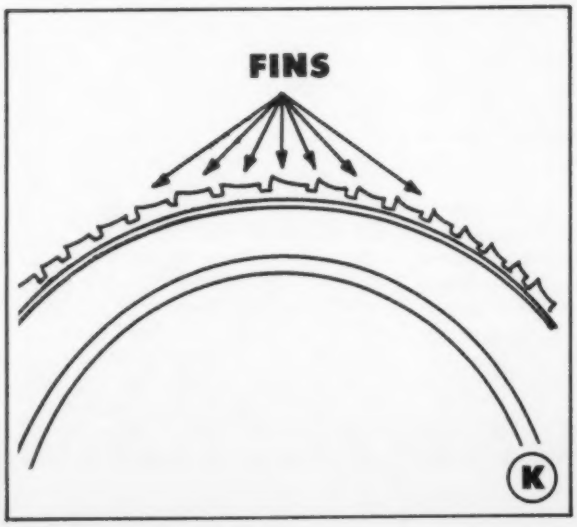
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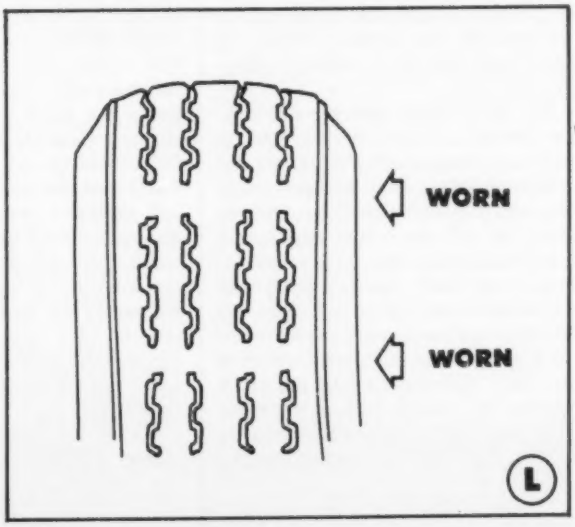
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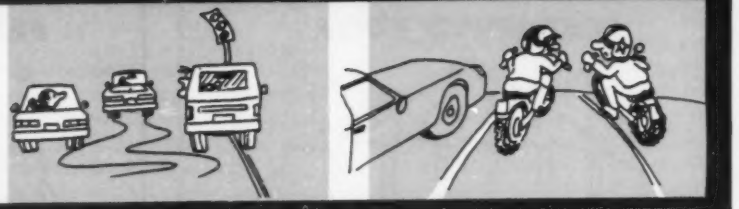
BACKFIRE
LETTERS to the EDITOR



DRIVE DEFENSIVELY ALWAYS

Your November issue of DRIVER talked a lot about alcohol. Other drugs are hazardous too. May I relate the following:

While driving home from work across a busy section of town, I noticed an erratic driver coming up behind me. She had already run over one curb and crossed the double yellow line twice. I moved over and allowed her to pass. She continued to move from lane to lane bumping the curb often. Her motions were unnatural and she seemed to have little control of her senses.

While stopped at a light I got out and asked her if something was wrong with her steering. She didn't answer. I don't believe she understood my question. I sniffed inside her car and no odor of alcohol or drugs was present, yet she was obviously "high" on something. I told her she was in no condition to drive, but she just turned away. The light changed and she rolled up her window and drove away. I was determined to follow her and help in whatever way I could to prevent an accident which I was sure she would be involved in. Her manner of driving was dangerous and I wanted to keep an eye on her.

She continued through the next few green lights just missing several vehicles. Many people had to get out of her way or get hit. She made a nice left turn from the right lane, cutting someone off, and then continued down a side street on the wrong side. A pickup truck panic-stopped and she weaved around to the right, hit the curb and continued on. I followed her for 11 blocks downtown towards the mall. She pulled into the back parking lot, nearly hitting a pedestrian, and parked across two parking spaces. I got out and rushed over to her car on the passenger side and removed her keys.

A taxi driver who had watched most of the event called the police. I believe nothing was done as her "high" soon wore down. A subsequent search of her and her vehicle was useless. No drugs or alcohol were found.

I felt relieved that no one was hurt, and was very glad that several defensive drivers were on their toes. My point is this, DRIVE DEFENSIVELY ALWAYS, and remember: Holidays and weekends aren't the only days for caution on the roadways, it's ALWAYS.

SP5 Jeff Sample
Fort Sill, OK

OFF THE CENTER LINE

I want to join with Captain Clarke of San Diego, California (November 1982 BACKFIRE) in his comments about whether motorcyclists should avoid the center of the traffic lane.

The only time one should be on the center line is when *crossing* it to get to the other side of the lane. One reason of course, is due to the road mung that collects on the center line. Another equally important reason concerns the necessity to position the motorcycle in the lane (either right or left wheel track) based on specific traffic conditions.

I probably spend the majority of my riding time in the left-side tire track. I would do this regardless of the condition of the center line. Why? Because I feel that it is vitally important to very obviously assume our place in the traffic flow. By being *out there*, we are much more visible to all concerned.

As for the "old wive's taboo" nonsense, I have *never* seen it recommended that a motorcycle actually travel any distance on the center line. *Never.* This includes the recently completed motorcycle safety course I had to attend in order to get my sticker renewed for 1983.

Let's stay off the center line.

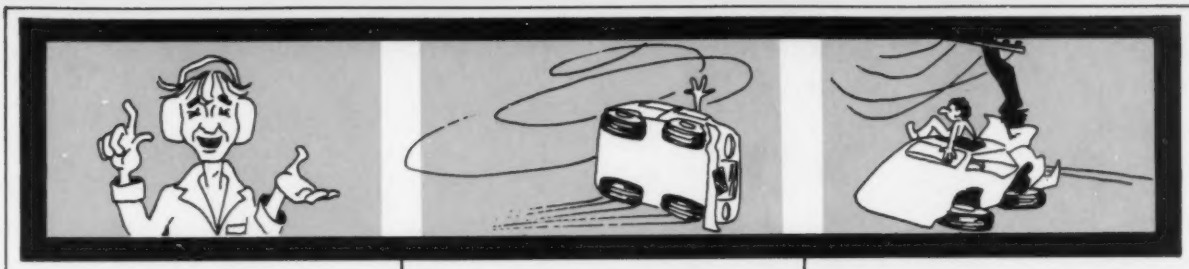
Joseph Louis Krizsa
Wright-Patterson AFB, OH 45433

And DRIVER has never recommended riding in the center of the lane for any extended distance, either. The original DRIVER story that prompted the letters about riding in the center of the lane focused on being seen by cross traffic, that is, at intersections. Lane positioning is a fluid situation that is constantly changing – as you will see in an upcoming DRIVER article.

THE SEATBELT DID THE JOB

On Thursday, 16 December 1982, as I was driving off base heading for Los Angeles, my attention was diverted for just an instant. At that moment my car hit the soft shoulder of the road which was wet.

Even though my car was only a few inches onto the shoulder and my speed was no more than 40 mph (I had just changed into 3rd gear on my Honda CVCC), the vehicle was thrown off balance. I skidded across the road trying to regain control and, with the car still turning around, hit the opposite shoulder of the road where my vehicle flipped over onto its side. I felt the belt tighten just before the sudden impact. In my heart of hearts I know that had I not been wearing that seatbelt I would have been severely injured and probably thrown through the front windshield. When a kindly neighbor happened by and helped me out of my overturned



vehicle, the seatbelt was so tight that I had to wriggle around and almost had to get into a standing position to undo it. Together with the headrest, the safety belt did the job it was engineered to do it saved the driver's life in an accident.

Mrs. Maureen Garrettson
Edwards AFB, CA

SILENCE IS NOT ALWAYS GOLDEN

Most bikers have heard the standard arguments for wearing helmets. But not many people know that helmets protect us in another way, noise. The average road-rider jeopardizes their hearing almost every time they ride their motorcycle. The bike, which mechanically might produce only 82 dBa, (your basic measurement of sound), isn't the problem. "At-ear" highway-cruising speed wind noise is the villain, and there's no practical way of reducing it for a safe day-long ride.

Studies by several independent institutions have reported roughly the same findings — that noise levels of 100 dBa can be reached at highway speeds. For those of you who chose not to wear a helmet, be aware that at-ear noise generated at 55 mph without a helmet can be up to 120 dBa. One-hundred-twenty dBa is on the threshold of pain; it is what you would hear inside a loud disco or if you stand 1000 feet away from a jet during take-off.

The Air Force has gone to great lengths to provide you with a safe and healthful work environment. Federal safety standards call for a maximum allowable eight-hour noise exposure of 85dBa. So you can see that a one-day ride can do you more harm than being at work.

Noise effects humans in many ways, but an important effect to bikers is that prolonged noise causes fatigue. So before you start blaming your cycle for your exhaustion at the end of the riding day, think again. Have you done anything to prevent noise fatigue?

There are so many variables, including helmet fit, brand, and shield configuration, that it is difficult to devise a formula for you to sit down and figure out what at-ear noise you are likely to be experiencing. As a very general rule, you should not ride more than two hours per day without somehow reducing the noise you are exposed to (such as riding slower or less than two hours per day). The most practical method is by wearing ear protectors — either plugs or custom ear molds. Most people would not dream of getting on their bikes without putting on their helmets or when they were three sheets to the wind. That is common sense, but it is equally important to consider the uncommon or unseen problems. Preventive medicine is available. Practice it, and you will be able to devote time to really important things — like which roads you want to explore this spring.

TSgt. Donald G. Stormoen, USAF
Mt. Home AFB, ID 38648

Preventive medicine and ear protection are important. While the short term effect is fatigue, the long term results may involve hearing impairment.

LONG TERM STORAGE

The September 1975 DRIVER contained an article which provided detailed advice on preparing an automobile for long-term storage.

I saved that article and put it to good use in 1976 when I was transferred to Venezuela for a three-year tour. As it turned out, that tour was followed by another in South America and it was six-and-one-half years before I returned to CONUS and was able to take my car out of storage. Expecting the worst, it was a pleasant surprise when, after only an hour of routine preparation and the installation of a new battery, the car started easily and ran like new.

The vehicle has been in daily use for six months now with no problems. Thank you for that outstanding article on storage. Perhaps an occasional reprint would prove useful to other readers.

Capt C.J. Stuart, Jr., USN
San Francisco, CA 94130

CHRISTMAS CHECK SAVED A LIFE

Just prior to Christmas, we had a seatbelt check and discovered two individuals not wearing seatbelts. One individual was counseled by his supervisor (the Unit Commander) and he promised to wear seatbelts from then on.

One week later, while driving home late at night from work in his Corvette, he was involved in a serious accident. A car pulled out from a side street directly into his path. Our Officer swerved to avoid the car, lost control and hit a telephone pole at 40 mph. Upon impact, the T-Top on his Vette popped out, the frame was bent, and the car was totally destroyed. The happy part is that this Officer walked away from the mishap without even a bruise. Of course, he was wearing his seatbelt.

Capt David A. Levine, USAF
Eglin AFB, FL 32542

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